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(56) Documents cited

US 4595075

US 4383592

US 4298092

US 3809181

US 3692145

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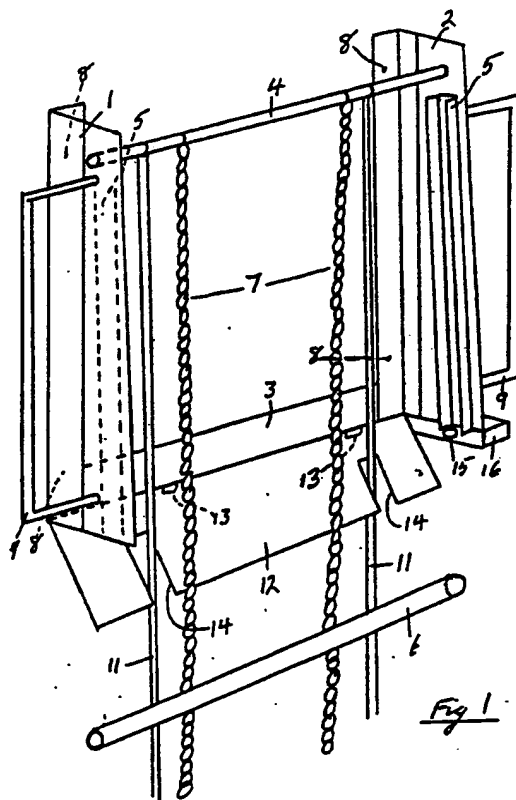
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(54) Fire escape

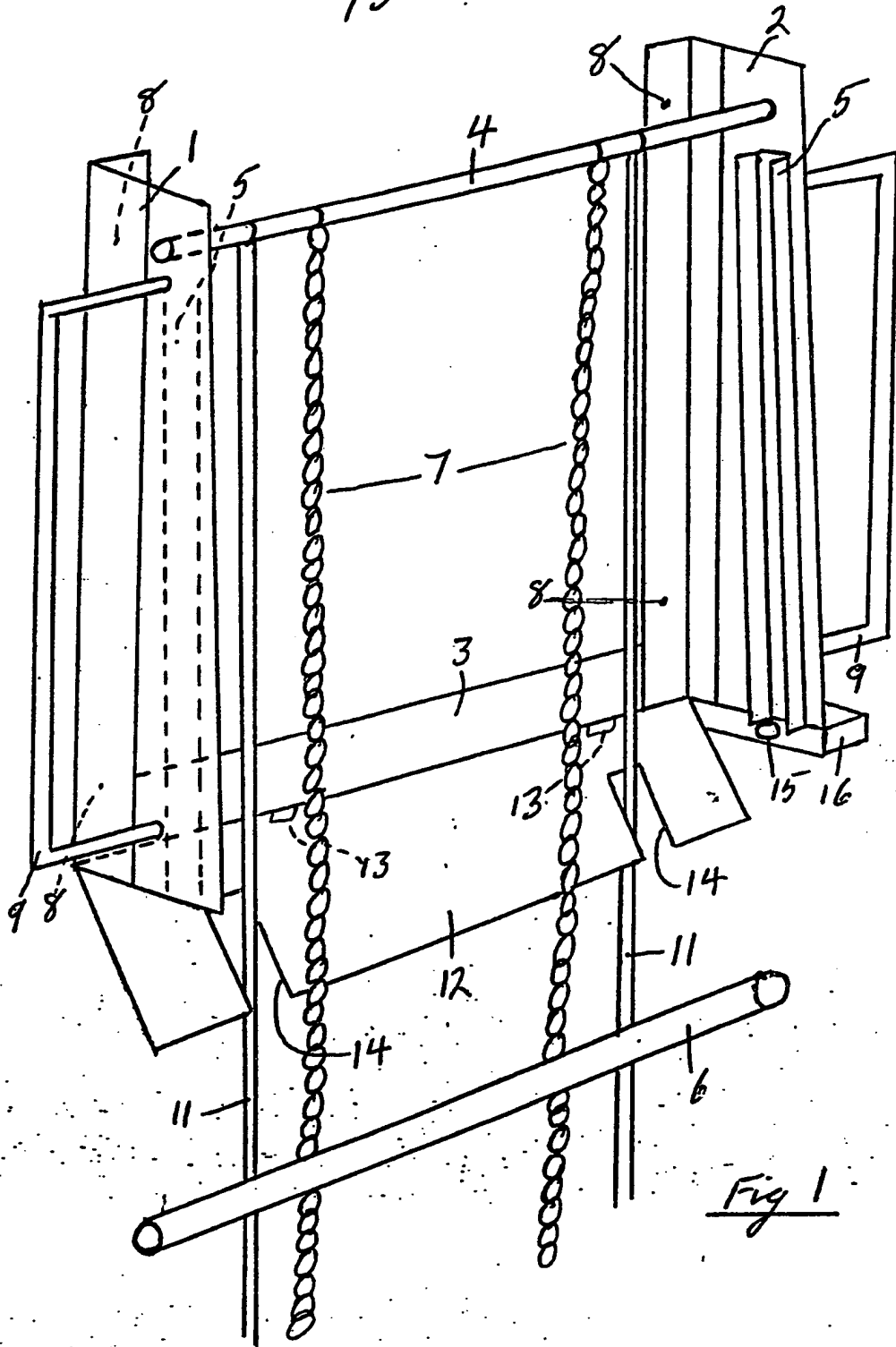
(57) A fire escape comprises a casing having side members (1, 2) which are adapted to be mounted on the wall of a building, by means of anchoring bolts passing through holes (8) in the side members, to one side of or below a window. A collapsible ladder comprising chains (7) and rungs (6) is suspended from a rod or bar (4) extending between the side members (1, 2) and is adapted to be housed in the casing, when not in use, in guides (5) mounted on the side members (1, 2). The ladder is retained in the casing by means of a bottom plate (12) which is normally held in a closed position by a bolt (15) which, when activated by electrical actuating means, is retracted into a casing (16) to permit the bottom plate (12) to drop down to release the ladder. Guide rods or cables (11) ensure that the ladder is spaced from the wall of the building in its deployed position. Grab handles (9) may be provided on the sides of the side members (1, 2).



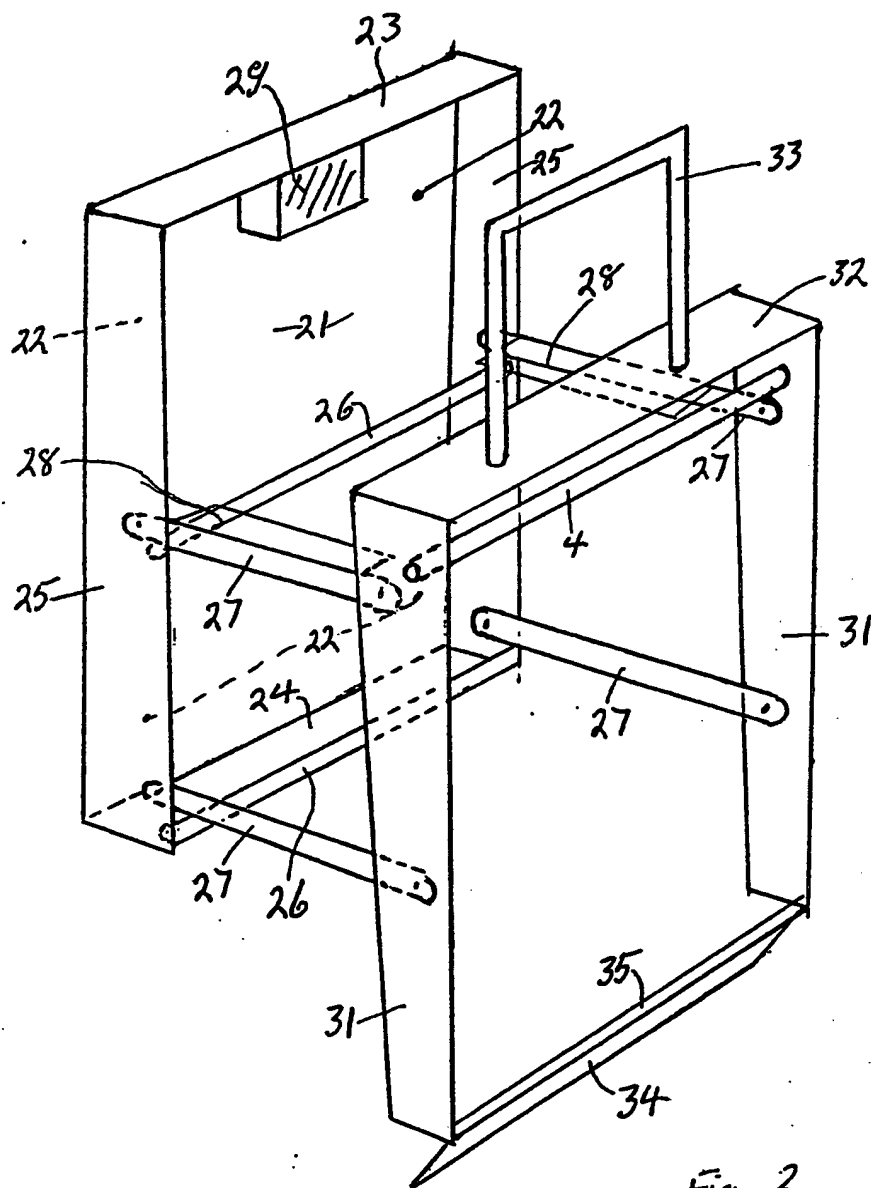
The drawing(s) originally filed was (were) informal and the print here reproduced is taken from a later filed formal copy.

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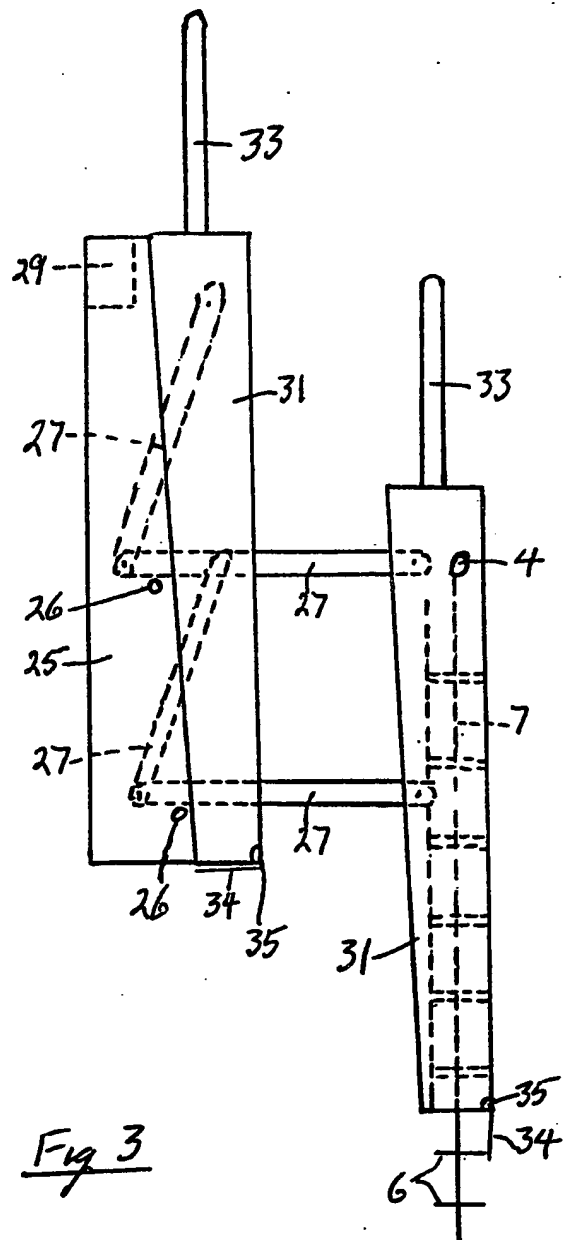
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Fig 1

2/3

Fig 2

3/3



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- 1 -

Title:

FIRE ESCAPE

This invention relates to improvements in fire escapes.

It is known to mount fire escapes in the form of ladders on the outside walls of buildings. However, 5 when such ladders are permanently installed, they provide ready access to a building for burglars. Moreover, the cost of such structures is such that it is usually not economically possible to provide a permanent fire escape ladder for every room in a 10 building so that some rooms do not have ready and immediate access to a fire escape.

The present invention aims to overcome the above-mentioned disadvantages.

According to the invention, there is provided a fire 15 escape comprising a casing adapted to be mounted on the wall of a building and a collapsible ladder adapted to be mounted in the casing when not in use, wherein the bottom of the casing is normally retained in position by releasable retaining means and the 20 ladder is arranged to rest on said casing bottom and wherein, on actuation of the retaining means, the casing bottom is released to allow the ladder to drop out of the casing through the bottom thereof, the upper end of the ladder being secured to the casing so 25 that, in its operative condition, the ladder hangs down from the casing for use as a fire escape.

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In either case, the releasable retaining means desirably comprise at least one electrically actuated bolt. The bolt(s) may be activated to release the casing bottom when activated by a smoke detector located
5 in the building. A manual override switch may also be provided in the room adjacent to the window of which the casing is mounted. The bottom of the casing is preferably pivotally mounted on the casing by one or more hinges.

- 10 A lamp may be provided to illuminate the fire escape. Means may be provided to ensure that the lamp is lit only when the ladder is deployed for use.

The invention will now be further described, by way of example, with reference to the drawings in which:-

- 15 Fig.1 is a perspective view of one embodiment of a fire escape according to the invention;

Fig.2 is a perspective view of another embodiment of a fire escape according to the invention; and

- Fig.3 is a side elevation of the fire escape shown
20 in Fig.2.

In the drawings, like parts are denoted by like reference numerals.

- Reference will first be made to Fig.1 of the drawings in which the fire escape essentially comprises a
25 pair of L-sectioned side members 1 and 2 which are connected together in a spaced-apart condition by a back plate 3 and an upper rod or bar 4. A U-sectioned

guide 5 is mounted on each of the side members 1 and 2 on the sides which are facing each other. The guides 5 are adapted to receive the ends of the rungs of a ladder, only the uppermost rung 6 of which is shown in Fig.1. The rungs of the ladder are secured together in a spaced-apart condition by a pair of chains 7, the upper ends of which are secured to the rod or bar 4.

The casing is adapted to be mounted on the wall of a building, to one side of or below a window, by means of the side members 1 and 2, said side members being provided with holes 8 through which may pass anchoring bolts (not shown) which are anchored to the wall at an appropriate position. Grab handles 9 are mounted on the outer sides of the side members 1 and 2 to assist a person in getting out of a window and onto the ladder of the fire escape.

In order to space the ladder from the wall so as to make it easier for a person to climb down the ladder, a pair of guide rods or cables 11 are secured to the upper rod or bar 4 and depend downwardly from the casing. The lower ends of the guides 11 may be secured at their lower ends to the ground or to the wall of the building adjacent to the ground.

The bottom of the casing comprises a plate 12 in the form of a trap or flap which is pivotally mounted on the back plate 3 by means of a pair of hinges 13 which may take any convenient form as will be appreciated by those skilled in the art. Cut-out portions 14 are provided in the bottom plate 12 to permit the guides 11 and chains 7 to extend through

the plate when said plate is in its normally-closed position (not shown in Fig.1). The plate is arranged to be held in the closed position by means of an electrically-actuated bolt 15, only the end of which
5 is shown in the drawing. The bolt is mounted in a casing 16 which is secured to the side member 2.

When the fire escape according to the invention is not in use, the ladder is folded up within the casing with the ends of the rungs of the ladder engaged
10 in the guides 5 and the bottom plate 12 in the closed position in which the ladder rests on said bottom plate. The plate 12 is retained in this position by the bolt 15.

Electrical means (not shown) for actuating the bolt.
15 15 are installed within the casing 16 and are electrically connected to means installed within the building for activating the bolt actuating means. Preferably, said activating means comprise a smoke detector and may include a manual override switch located in the
20 room adjacent to which the fire escape is mounted. Alternatively, the smoke detector may be omitted and reliance placed entirely on the manual override switch. In either case, when the bolt actuating means are activated, the bolt 15 is moved from its normal
25 position (not shown) in which it projects from the casing 16 and supports the plate 12 to its retracted position in which it is located within the casing 16 as shown in the drawing. The plate 12 now drops down to the position shown in the drawing and the
30 ladder is free to fall from the casing to its operative position.

Turning now to Figs.2 and 3, in this embodiment a substantially rectangular framework having a back plate or base plate 21 is adapted to be secured to the wall of a building by means of anchoring bolts 5 (not shown) which pass through holes 22 provided in the back plate 21. The framework is box-shaped having an upper wall 23 which is shallower than the lower wall 24 whereby the edges of the two side walls 25 are inclined as indicated in Fig.3. A pair of rods 26 extend across the framework and are mounted at their ends in the opposite side walls 25. A respective pair of links 27 are pivotally mounted on each of the side walls 25 and each link is arranged to bear on a respective one of the rods when the links 15 are in the lower position shown in Fig.2.

The other ends of the links 27 are pivotally connected to the side walls 31 of a casing which side walls are interconnected at the upper ends by an upper wall 32. Extending between the side walls 31 adjacent 20 to but spaced from the upper wall 32 is a rod or bar 4 secured at its ends in the opposite side walls 31. This rod or bar is similar to the rod or bar 4 shown in Fig.1 and is adapted to receive and support the upper ends of a pair of chains for the ladder 25 which is not shown in Figs.2 and 3 but which is similar to the ladder shown in Fig.1. A grab handle 33 is mounted on the top surface of the upper wall 32. The bottom of the casing comprises a plate 34 secured to a rod 35 the ends of which are pivotally mounted 30 in the side walls 31 at the lower ends thereof. The plate 34 takes the form of a trap or flap which is similar to the plate 12 shown in Fig.1, except that no cut-out portions are provided, and the plate is

again arranged to be held in the closed position by means of an electrically-actuated bolt (not shown). Guides similar to the guides 5 shown in Fig.1 are desirably mounted on the inner facing surfaces of the side walls 31.

When the fire escape is not in use, the ladder is folded up within the casing, the bottom plate 34 is closed and held in this position by the bolt and the casing is moved from the position shown in Fig.2 to the position shown in the left half of Fig.3. A manually- or electrically-actuated catch may be provided on the upper wall 23 of the framework and/or the upper wall 32 of the casing to hold and retain the casing in this position. However, the inclined arrangement of the side walls of the framework and casing will also achieve this.

When the bolt actuating means (not shown) are activated, the bolt is moved to release the plate 34 so that the plate drops down under the weight of the ladder so that the ladder is free to fall from the casing to its operative position. The casing should now be moved to the position shown in Fig.2 and the right half of Fig.3 in which the links 27 bear on the support rods 26 and the casing is spaced from the wall of the building. Guide rods or cables are therefore not required with this embodiment.

In order to provide increased strength and rigidity, each of the links 27 may be provided with a stiffening web 28 as indicated on the upper links 27 in Fig.2. Further, a lamp 29 may be provided on the lower surface of the upper wall 23 of the framework if desired, the lamp preferably being arranged to be lit only when the casing is deployed for use.

In either or both of the above-described embodiments, the electrical circuit for activating the bolt actuating means will normally be connected to the electrical mains of the building. However, auxiliary batteries, 5 similar to those installed in burglar alarm systems, are preferably incorporated in the circuit to provide emergency operation in the event of mains failure.

A cover for the casing is desirably provided to protect the ladder and guides from the effects of inclement 10 weather. The cover preferably takes the form of a detachable flexible plastics hood or the like although other more substantial covers may be provided if desired.

The invention is not restricted to the above-described 15 embodiments but variations and modifications may be made without departing from the scope thereof. For example, the chains 7 may be replaced by other flexible members although these should preferably be made of a non-flammable material. Further, although 20 only one electrically-actuated bolt has been shown in Fig.1 of the drawings, further bolts may be provided if desired. Preferably, a second bolt and associated actuating means are provided on the side member 1 to co-operate with the end of the plate 12 remote 25 from the bolt 15. Similarly, a pair of bolts may be provided for the embodiment shown in Figs. 2 and 3, a respective bolt being provided on each side wall 31 of the casing.

Moreover, instead of providing a single grab handle 30 33 on the top of the casing shown in Figs.2 and 3, a pair of grab handles may be provided if desired, one on each side wall 31 of the casing.

It will be seen that the fire escape according to the invention is comparatively cheap to manufacture and is convenient and easy to install. The cost is such that it is possible to provide a fire escape
5 according to the invention for every upper floor room of a building. Further, when in the inoperative position, the fire escape according to the invention does not provide ready access to the building for burglars so that the disadvantages of the existing
10 fire escapes are overcome by means of the fire escape according to the invention.

CLAIMS

1. A fire escape comprising a casing adapted to be mounted on the wall of a building and a collapsible ladder adapted to be mounted in the casing when not in use, wherein the bottom of the casing is normally retained in position by releasable retaining means and the ladder is arranged to rest on said casing bottom and wherein, on actuation of the retaining means, the casing bottom is released to allow the ladder to drop out of the casing through the bottom thereof, the upper end of the ladder being secured to the casing so that, in its operative condition, the ladder hangs down from the casing for use as a fire escape.
2. A fire escape according to claim 1, wherein the ladder comprises a plurality of rungs which are spaced apart from and connected to each other by a pair of chains of metal or non-flammable material.
3. A fire escape according to claim 1 or claim 2, wherein guides are provided in order to space the ladder from the wall of a building on which the casing is mounted.
4. A fire escape according to claim 3, wherein the guides take the form of a pair of rods or cables depending downwardly from the casing.
5. A fire escape according to claim 1 or claim 2, wherein the casing is pivotally connected to a framework which framework is adapted to be mounted on the wall of a building.

6. A fire escape according to claim 5, wherein the pivotal connection between the framework and the casing comprises a series of links pivotally connected to the side walls of the casing and the framework.

7. A fire escape according to any preceding claim, wherein the casing is provided with at least one grab handle.

8. A fire escape according to claim 7, wherein a pair of grab handles are provided, one on each side of the casing.

9. A fire escape according to claim 7, wherein a single grab handle is provided on top of the casing.

10. A fire escape according to any preceding claim, wherein the releasable retaining means comprise at least one electrically actuated bolt.

11. A fire escape according to claim 10, wherein the or each bolt is arranged to be activated by a smoke detector located in a building on which the casing has been mounted.

12. A fire escape according to any preceding claim, wherein the bottom of the casing comprises a plate pivotally mounted on the casing.

13. A fire escape according to any preceding claim, wherein the casing has side walls provided with guides for receiving the ends of the rungs of the ladder when said ladder is mounted in its inoperative condition in the casing.

14. A fire escape according to any preceding claim, wherein the casing is provided with a detachable cover.

15. A fire escape substantially as described herein with reference to Fig.1 of the drawings.

16. A fire escape substantially as described herein with reference to Figs. 2 and 3 of the drawings.